

\* \* \* \* \*  
 FILE 'USPAT' ENTERED AT 14:36:54 ON 08 JUN 96  
 \* \* \* \* \*  
 \* W E L C O M E T O T H E \*  
 \* U. S. P A T E N T T E X T F I L E \*  
 \* \* \* \* \*

```

=> s natural rubber#
      216768 NATURAL
      233430 RUBBER#
L1      14812 NATURAL RUBBER#
          (NATURAL(W) RUBBER#)
=> s graft# or grafted or grafting
      20793 GRAFT#
      11454 GRAFTED
      9509 GRAFTING
L2      27546 GRAFT# OR GRAFTED OR GRAFTING
=> s methylmethacrylate or methyl meth acrylate or methyl methacrylate or
methylmeth acrylate

      6552 METHYLMETHACRYLATE
      241320 METHYL
      13391 METH
      55836 ACRYLATE
      1248 METHYL METH ACRYLATE
          (METHYL(W) METH(W) ACRYLATE)
      241320 METHYL
      54891 METHACRYLATE
      30301 METHYL METHACRYLATE
          (METHYL(W) METHACRYLATE)
      52 METHYLMETH
      55836 ACRYLATE
      24 METHYLMETH ACRYLATE
          (METHYLMETH(W) ACRYLATE)
L3      34339 METHYLMETHACRYLATE OR METHYL METH ACRYLATE OR METHYL METHAC
RYL
          ATE OR METHYLMETH ACRYLATE
=> s 11(1)12(1)13
L4      740 L1(L) L2(L) L3
=> s 11(p)12(p)13
L5      121 L1(P) L2(P) L3
=> s deproteiniz##### or deproteinis#####
      632 DEPROTEINIZ#####
      56 DEPROTEINIS#####
L6      681 DEPROTEINIZ##### OR DEPROTEINIS#####
=> s 15(1)16
L7      1 L5(L) L6
  
```

=> d 17 cit 1

1. 3,661,674, May 9, 1972, METHOD FOR THE MANUFACTURE OF FLEXIBLE SHEET MATERIALS; Maurice William Higgs, et al., 156/280, 148, 254; 427/430.1, 439; 428/234, 235, 289, 296, 297, 301, 302, 304.4, 904 [IMAGE AVAILABLE]  
=> d 17 fro 1

US PAT NO: 3,661,674 [IMAGE AVAILABLE] L7: 1 of 1  
DATE ISSUED: May 9, 1972  
TITLE: METHOD FOR THE MANUFACTURE OF FLEXIBLE SHEET MATERIALS  
INVENTOR: Maurice William Higgs, Pelsall, England  
Dennis Ivor Clarke, Erdington, England  
ASSIGNEE: Dunlop Holdings Limited, London, England  
APPL-NO: 05/079,679  
DATE FILED: Oct. 9, 1970  
REL-US-DATA: Continuation of Ser. No. 625,002, Mar. 22, 1967,  
abandoned.  
FRN-PRIOR: Great Britain 15,413/66 Apr. 6, 1966  
INT-CL: B32b 31/12; B32b 31/26  
US-CL-ISSUED: 156/280; 117/104, 121.2, 135.5, 140; 156/148, 254;  
161/151, 154, 155, 156, 159  
US-CL-CURRENT: 156/280, 148, 254; 427/430.1, 439; 428/234, 235, 289, 296,  
297, 301, 302, 304.4, 904  
SEARCH-FLD: 117/98, 104, 121.2, 135.5, 140; 156/148, 254, 278, 280;  
161/151, 154, 155, 156, 159, 170  
REF-CITED:  
U.S. PATENT DOCUMENTS  
3,193,437 7/1965 Schafer 161/89  
ART-UNIT: 164  
PRIM-EXMR: William A. Powell  
LEGAL-REP: Stevens, Davis, Miller & Mosher

ABSTRACT:

To form a flexible leather-like sheet material a compressed sheet of cellular material is adhered to one or each surface of the resulting assembly, the binder is allowed to permeate and impregnate the assembly and the impregnated assembly is heated to set the binder. The term "fibrous material" is broadly defined in order to include also cellular non-fibrous materials.

13 Claims, No Drawings

=> d 17 kwic

US PAT NO: 3,661,674 [IMAGE AVAILABLE] L7: 1 of 1

SUMMARY:

A . . . of a fibrous or cellular material. The adherence may be attained by means of a suitable adhesive, for example a **\*\*natural\*\* \*\*rubber\*\*** latex (especially a **\*\*deproteinized\*\* \*\*natural\*\* \*\*rubber\*\*** latex), a polychloroprene latex, an ethylene/vinyl acetate copolymer adhesive, a latex of a **\*\*graft\*\*** copolymer of **\*\*natural\*\* \*\*rubber\*\*** and poly(**\*\*methyl\*\* \*\*methacrylate\*\***), a solvent-based neoprene adhesive, a polyurethane adhesive or a carboxylated styrene/butadiene copolymer latex. Alternatively, the surface of the compressed sheet. . .  
=> d 15 cit 1-121

1. 5,488,086, Jan. 30, 1996, Polycarbonate resin composition; Takashi Umeda, et al., 525/92A, 92E, 104, 439, 446, 464 [IMAGE AVAILABLE]
2. 5,475,053, Dec. 12, 1995, Molding composition having a matt surface; Norbert Niessner, et al., 525/64, 66, 67, 68, 71, 73, 77, 78, 279, 293 [IMAGE AVAILABLE]
3. 5,466,757, Nov. 14, 1995, Process for production of chlorinated ethylene-propylene copolymers; Naotoshi Watanabe, et al., 525/352; 524/201, 211, 424, 425, 430; 525/263, 334.1, 356, 358, 368, 369 [IMAGE AVAILABLE]
4. 5,441,810, Aug. 15, 1995, Adhesive sheet; Kaoru Aizawa, et al., 428/354, 40.2, 174, 304.4, 352, 402, 402.2 [IMAGE AVAILABLE]
5. 5,427,851, Jun. 27, 1995, Pressure sensitive adhesive and adhesive coated product; Rajendra Mehta, 428/356, 355, 496, 537.5; 524/88, 925, 928; 525/84 [IMAGE AVAILABLE]
6. 5,380,786, Jan. 10, 1995, Polyvinyl chloride blends having improved physical properties including low temperature brittleness; William S. Greenlee, et al., 524/560; 525/239, 244 [IMAGE AVAILABLE]
7. 5,371,134, Dec. 6, 1994, Electrically conductive resin compositions; Kazushige Inoue, 524/495; 252/502, 511; 523/137; 524/404, 439, 452, 492, 494, 496 [IMAGE AVAILABLE]
8. 5,356,991, Oct. 18, 1994, Polyester-based shock-resistant compositions and process for their preparation; Antonio Chiolle, et al., 525/66, 67, 92A, 131, 133, 148 [IMAGE AVAILABLE]
9. 5,328,953, Jul. 12, 1994, Rubber compositions with alkoxyalkanoic acid having improved processability vulcanisate properties; Eric R. Lynch, 525/332.7, 330.9, 331.8, 346, 349 [IMAGE AVAILABLE]

10. 5,288,807, Feb. 22, 1994, Vinyl monomer compositions with accelerated surface cure; Frederick P. Hinz, 525/279; 106/719; 524/8, 785, 853, 854, 856; 525/245, 263, 289, 290, 292, 303, 304, 310, 316 [IMAGE AVAILABLE]
11. 5,274,033, Dec. 28, 1993, Tough high melt flow polyamides; Bennett N. Epstein, 525/66, 179, 182, 183 [IMAGE AVAILABLE]
12. 5,253,691, Oct. 19, 1993, Tire having specified belt rubber composition; Richard M. Sriver, 152/537, 564 [IMAGE AVAILABLE]
13. 5,252,665, Oct. 12, 1993, Polyester based shock resistant compositions and process for their preparation; Antonio Chiolle, et al., 525/64, 92A, 173 [IMAGE AVAILABLE]
14. 5,207,961, May 4, 1993, Injection-moulded article and process for the production thereof; Joachim Wank, et al., 264/135, 255, 271.1 [IMAGE AVAILABLE]
15. 5,202,386, Apr. 13, 1993, Modification of (co)polymers employing organic peroxides; Andreas H. Hogt, et al., 525/298, 391, 392 [IMAGE AVAILABLE]
16. 5,194,497, Mar. 16, 1993, Alloys of thermoplastic polymers containing oxetanyl groups; Karl-Erwin Piejko, et al., 525/75, 93, 206; 526/266 [IMAGE AVAILABLE]
17. 5,190,818, Mar. 2, 1993, Adhesive composition for temporary adhesive bonding of paper sheets; Tsutomu Sakai, 428/355, 356, 496, 511, 512; 524/47, 492 [IMAGE AVAILABLE]
18. 5,157,087, Oct. 20, 1992, Organic peroxides and their use in the preparation of epoxide groups-containing (co)polymers; Andreas H. Hogt, et al., 525/298, 391, 392 [IMAGE AVAILABLE]
19. 5,124,242, Jun. 23, 1992, Silver halide photographic element with hydrophobic undercoat polymer layer and hydrophobic dye layer; Yasushi Hattori, et al., 430/510, 513, 523 [IMAGE AVAILABLE]
20. 5,118,805, Jun. 2, 1992, Phosphoroustrislactams and methods for their production; Jeffrey H. Glans, et al., 540/451; 525/397; 540/480, 481, 487, 542; 546/21, 25 [IMAGE AVAILABLE]
21. 5,115,021, May 19, 1992, Pneumatic tires; Robert J. Blythe, et al., 525/84; 152/209R; 525/78 [IMAGE AVAILABLE]
22. 5,112,908, May 12, 1992, Tough polyamide compositions having high

melt flow for complex moldings; Bennett N. Epstein, 525/66; 524/504, 514; 525/179, 182, 183, 184 [IMAGE AVAILABLE]

23. 5,098,818, Mar. 24, 1992, Silver halide photographic material and method for processing thereof; Tadashi Ito, et al., 430/434, 517, 522, 536, 963, 966 [IMAGE AVAILABLE]

24. 5,087,673, Feb. 11, 1992, Process for production of chlorinated ethylene-propylene copolymers; Naotoshi Watanabe, et al., 525/356, 334.1, 358 [IMAGE AVAILABLE]

25. 5,071,973, Dec. 10, 1991, Process for preparing of non-thrombogenic substrates; Ruprecht Keller, et al., 536/8; 424/486, 488; 514/54, 56; 523/122; 530/395; 536/4.1, 123, 124 [IMAGE AVAILABLE]

26. 5,070,152, Dec. 3, 1991, Use of phosphoroustrislactams as compatibilizing agents for polyphenylene oxide/polyester blends; Jeffrey H. Glans, et al., 525/397, 133, 392, 394, 905 [IMAGE AVAILABLE]

27. 5,037,897, Aug. 6, 1991, Use of phosphoroustrislactams as compatibilizing agents for polyphenylene oxide/polyester blends; Jeffrey H. Glans, et al., 525/397, 905 [IMAGE AVAILABLE]

28. 5,037,892, Aug. 6, 1991, Modification of (co)polymers employing organic peroxides; Andreas H. Hogt, et al., 525/298, 391, 392 [IMAGE AVAILABLE]

29. 5,026,780, Jun. 25, 1991, Water swellable resin composition; Minoru Takizawa, et al., 525/301; 524/588, 589, 599; 525/64, 66, 71, 76, 77, 78, 80, 86 [IMAGE AVAILABLE]

30. 4,918,128, Apr. 17, 1990, Pressure-sensitive adhesive; Tsutomu Sakai, 524/450, 458, 504, 533; 525/310 [IMAGE AVAILABLE]

31. 4,898,223, Feb. 6, 1990, Stiff rubber composition and articles having components thereof; Thomas J. Botzman, et al., 152/547; 525/83, 84 [IMAGE AVAILABLE]

32. 4,857,574, Aug. 15, 1989, Dispersion of addition (co)polymers in an organic liquid; Roelof Buter, 524/396, 398, 399, 400, 431, 441, 474, 779, 780, 781, 783, 785, 786, 856; 525/123, 131, 286, 301, 302, 303, 310, 316, 340 [IMAGE AVAILABLE]

33. 4,828,901, May 9, 1989, Injection-moulded article and a process for the production thereof; Joachim Wank, et al., 428/76; 427/213.3, 213.36; 428/334, 335, 423.1, 423.5, 423.7, 424.6, 457 [IMAGE AVAILABLE]

34. 4,814,227, Mar. 21, 1989, Adhesive sheet for preventing aquatic growths and method for preventing aquatic growths; Kunio Maeda, et al., 428/353; 156/71, 233; 428/344, 354, 416, 907 [IMAGE AVAILABLE]
35. 4,810,321, Mar. 7, 1989, Process for the preparation of a metal-plastic laminate; Joachim Wank, et al., 156/244.23, 331.7 [IMAGE AVAILABLE]
36. 4,770,921, Sep. 13, 1988, Self-shielding multi-layer circuit boards; Thomas P. Wacker, et al., 428/209; 174/250; 361/750; 428/447, 546, 549, 551, 901 [IMAGE AVAILABLE]
37. 4,743,643, May 10, 1988, Dispersion of addition (co)polymers in an organic liquid; Roelof Buter, 524/396, 398, 399, 400, 431, 441, 474, 779, 780, 781, 783, 785, 786, 856; 525/123, 131, 286, 301, 302, 303, 310, 316, 340 [IMAGE AVAILABLE]
38. 4,721,757, Jan. 26, 1988, Vinyl monomer compositions with accelerated surface cure; Frederick J. Schindler, 525/245, 248, 289, 290, 302 [IMAGE AVAILABLE]
39. 4,707,396, Nov. 17, 1987, Laminates; Joachim Wank, et al., 428/216, 412, 424.2, 424.6, 424.7 [IMAGE AVAILABLE]
40. 4,704,176, Nov. 3, 1987, Method of bonding polyurethane to cured rubber; Thomas J. Botzman, 156/125, 96, 123, 128.6, 315, 332, 338; 264/135, 265, 269, 275 [IMAGE AVAILABLE]
41. 4,686,149, Aug. 11, 1987, Magnetic recording medium and method of preparing; Masashi Aonuma, et al., 428/522; 427/129, 131, 491; 428/500, 694BA, 694BN, 694BS, 694BU, 900 [IMAGE AVAILABLE]
42. 4,656,070, Apr. 7, 1987, Coextruded recoverable articles; David D. Nyberg, et al., 138/141, 99; 156/52, 86, 244.13, 244.24; 174/DIG.8; 428/34.9 [IMAGE AVAILABLE]
43. 4,650,951, Mar. 17, 1987, Method of welding laminates each having the structure of metal layer/thermally softenable insulating layer/metal layer; Hitoshi Koga, et al., 219/118, 91.2 [IMAGE AVAILABLE]
44. 4,590,268, May 20, 1986, Process for the preparation of 1-diorganocarbamoyl-polyalkylpiperidines; Friedrich Karrer, 544/124, 212, 218, 230; 546/15, 186, 187, 188, 189, 192, 207 [IMAGE AVAILABLE]
45. 4,522,888, Jun. 11, 1985, Electrical conductors arranged in multiple layers; Charles W. Eichelberger, et al., 428/546; 427/103, 123, 436; 428/699, 901 [IMAGE AVAILABLE]

46. 4,495,251, Jan. 22, 1985, Shielded plastic microwave oven cavity; Charles W. Eichelberger, et al., 428/548; 219/756; 427/96, 105; 428/560, 561 [IMAGE AVAILABLE]
47. 4,487,811, Dec. 11, 1984, Electrical conductor; Charles W. Eichelberger, et al., 428/546; 427/96, 98 [IMAGE AVAILABLE]
48. 4,481,332, Nov. 6, 1984, Heat resistant polyphenylene ether composition; Akiyoshi Somemiya, et al., 525/132, 68, 474; 528/211 [IMAGE AVAILABLE]
49. 4,480,011, Oct. 30, 1984, Anti-corrosion and anti-fouling marine coatings; Jean-Pierre Durand, et al., 428/474.4; 106/15.05; 427/409, 413; 428/462, 476.3, 492, 493, 907 [IMAGE AVAILABLE]
50. 4,470,883, Sep. 11, 1984, Additive printed circuit process; Charles W. Eichelberger, et al., 205/85, 125, 227; 427/96, 98 [IMAGE AVAILABLE]
51. 4,468,436, Aug. 28, 1984, Magnetic recording material; Tsutomu Okita, et al., 428/423.3; 360/131, 134; 427/131, 502, 506; 428/425.9, 520, 694BC, 694BS, 694TS, 900 [IMAGE AVAILABLE]
52. 4,466,850, Aug. 21, 1984, Method for fabricating a one-time electrically activated switch; Charles W. Eichelberger, et al., 156/276, 277, 307.3 [IMAGE AVAILABLE]
53. 4,438,158, Mar. 20, 1984, Method for fabrication of electrical resistor; Charles W. Eichelberger, et al., 427/101; 252/518; 338/20, 308; 427/126.3, 304, 306, 372.2, 380, 385.5; 524/406, 430 [IMAGE AVAILABLE]
54. 4,423,103, Dec. 27, 1983, Patternized coating; John Bogdany, 428/95; 427/271, 356; 428/159, 167, 304.4 [IMAGE AVAILABLE]
55. 4,420,573, Dec. 13, 1983, Method of treating water-in-oil dispersions; Sidney G. Fogg, et al., 523/333; 210/924, 925; 523/334, 335, 336, 339; 524/917 [IMAGE AVAILABLE]
56. 4,416,914, Nov. 22, 1983, Electrical conductors arranged in multiple layers and preparation thereof; Charles W. Eichelberger, et al., 427/510, 96, 98, 123, 205, 385.5, 386, 436 [IMAGE AVAILABLE]
57. 4,404,237, Sep. 13, 1983, Fabrication of electrical conductor by replacement of metallic powder in polymer with more noble metal; Charles W. Eichelberger, et al., 427/96; 338/308, 314; 427/98, 101, 102, 103, 123, 205, 436 [IMAGE AVAILABLE]



58. 4,385,082, May 24, 1983, Preparation of shielded plastic microwave oven; Charles W. Eichelberger, et al., 427/105; 174/35GC; 219/736, 756; 427/58, 230, 436 [IMAGE AVAILABLE]
59. 4,380,749, Apr. 19, 1983, One-time electrically-activated switch; Charles W. Eichelberger, et al., 338/215, 308, 314; 431/359 [IMAGE AVAILABLE]
60. 4,377,505, Mar. 22, 1983, Electrical resistor and fabrication thereof; Charles W. Eichelberger, et al., 252/512, 511, 518; 338/22R, 25, 308; 524/406, 430, 439 [IMAGE AVAILABLE]
61. 4,366,289, Dec. 28, 1982, Acrylate-grafted elastomers as polymer modifiers; Henno Keskkula, et al., 525/78, 76, 83, 84, 94 [IMAGE AVAILABLE]
62. 4,362,903, Dec. 7, 1982, Electrical conductor interconnect providing solderable connections to hard-to-contact substrates, such as liquid crystal cells; Charles W. Eichelberger, et al., 174/94R; 228/209; 359/87, 88 [IMAGE AVAILABLE]
63. 4,315,845, Feb. 16, 1982, Process for preparing chemically platable thermosetting powder coating; Hiroshi Takahashi, et al., 523/400, 458; 524/403, 413, 509, 904 [IMAGE AVAILABLE]
64. 4,267,282, May 12, 1981, Minimizing feed problems and reducing residual acrylonitrile monomer in processing nitrile polymers; Edward F. Tokas, 525/86, 75, 76, 77, 79, 80, 83, 87, 193, 198, 210, 213, 217, 222, 231, 234, 235, 237, 238, 239, 240, 241, 243, 313, 315, 316 [IMAGE AVAILABLE]
65. 4,255,486, Mar. 10, 1981, Methods and means for improvings resin bonds between substrates, and materials therefor and products therefrom; Oliver W. Burke, Jr., et al., 428/356, 436, 460, 483, 494, 506, 524, 529; 524/510 [IMAGE AVAILABLE]
66. 4,254,201, Mar. 3, 1981, Pressure sensitive adhesive toner of clustered encapsulated porous particles for use in electrostatic photography; Yuji Sawai, et al., 430/111; 264/4.6; 428/402.2, 402.22, 403; 430/98, 106.6, 107, 109, 114, 138 [IMAGE AVAILABLE]
67. 4,248,778, Feb. 3, 1981, ABS-Polymers of high notched impact strength; Bernhard Arnold, et al., 524/574, 311, 400, 529 [IMAGE AVAILABLE]
68. 4,221,681, Sep. 9, 1980, Method of forming graft copolymers by



attaching pre-polymerized side chains to a natural or unsaturated synthetic rubber backbone, and the resulting graft copolymers; David S. Campbell, et al., 525/194, 232, 376 [IMAGE AVAILABLE]

69. 4,212,136, Jul. 15, 1980, Abrading elements; Glenn A. Stertzbach, 451/540, 464, 470 [IMAGE AVAILABLE]

70. 4,207,364, Jun. 10, 1980, Heat-shrinkable laminate; David D. Nyberg, 138/141, 140, 178; 156/84, 85, 86; 174/73.1, DIG.8; 264/230; 428/34.9, 913 [IMAGE AVAILABLE]

71. 4,200,480, Apr. 29, 1980, Adhesive joining of pipes; Leon E. Wolinski, et al., 156/294; 138/145, DIG.1; 156/310, 314, 331.2, 332, 334; 285/423, 919; 427/302; 428/317.7, 420; 525/126 [IMAGE AVAILABLE]

72. 4,182,811, Jan. 8, 1980, Polymeric gel catalyst for polymerization of .alpha.-olefines, conjugated and non-conjugated dienes; Jury N. Bocharov, et al., 526/69; 502/109; 525/327.1, 356, 370; 526/139, 140, 141, 142, 144, 153, 159, 169.1, 169.2, 335, 348, 348.2, 351, 352, 904 [IMAGE AVAILABLE]

73. 4,168,192, Sep. 18, 1979, Process for making recoverable tubular article; David D. Nyberg, 156/86; 174/DIG.8; 428/34.9, 913 [IMAGE AVAILABLE]

74. 4,161,462, Jul. 17, 1979, Catalyst for (co) polymerization of ethylene, aplha-olefines, conjugated and non-conjugated dienes, a method of preparing same; Jury N. Bocharov, et al., 502/109, 117; 526/115, 124.2, 127, 128, 139, 140, 141, 142, 159, 160, 162, 308, 335, 340.2, 351, 352, 904 [IMAGE AVAILABLE]

75. 4,140,731, Feb. 20, 1979, Resin compositions having superior mechanical properties; Junichi Nakamura, et al., 525/75, 210, 289 [IMAGE AVAILABLE]

76. 4,131,584, Dec. 26, 1978, Elastomer latex composition; Oliver W. Burke, Jr., et al., 524/248 [IMAGE AVAILABLE]

77. 4,126,504, Nov. 21, 1978, Adhesive compositions and method employing same; Leon E. Wolinski, et al., 156/310, 314, 330, 331.6, 332; 428/321.5; 525/112, 165, 257, 273, 301, 308, 309, 315, 404, 407, 476, 529 [IMAGE AVAILABLE]

78. 4,115,617, Sep. 19, 1978, Weather-resistant adhesive film; Yukio Mitsuishi, et al., 428/336, 337, 339, 343, 344, 354, 458, 480 [IMAGE AVAILABLE]

79. 4,063,004, Dec. 13, 1977, Metal plating of plastics; Edward J. Quinn, 428/626; 205/166; 427/304, 306; 428/31, 457, 462, 913.3 [IMAGE AVAILABLE]
80. 4,053,450, Oct. 11, 1977, Dialkyl alkyl and cyclic phosphoramidomethyl phosphonates; Peter Golborn, et al., 524/117, 118, 124; 558/84, 122, 157, 169; 987/160 [IMAGE AVAILABLE]
81. 4,035,534, Jul. 12, 1977, Heat-shrinkable laminate; David D. Nyberg, 428/34.9; 138/137, 140, 141, 177; 156/84, 85, 86; 174/73.1, DIG.8; 264/135, 230; 285/381C, 381D; 428/516, 913 [IMAGE AVAILABLE]
82. 4,018,560, Apr. 19, 1977, Dialkyl alkyl and cyclic phosphoramidomethyl phosphonates; Peter Golborn, et al., 8/190, 116.4, 181, 194; 252/609; 428/921; 987/160 [IMAGE AVAILABLE]
83. 4,016,665, Apr. 12, 1977, Signboard using macromolecular elastomer having adhesive layer; Mitsushi Sakota, 40/582, 594; 428/343 [IMAGE AVAILABLE]
84. 4,012,350, Mar. 15, 1977, Liquid adhesive from phenoplast and m-aminophenol; Oliver W. Burke, Jr., et al., 524/510; 523/411; 524/511, 595, 596; 525/109, 139, 142, 145, 481, 486, 504; 528/99 [IMAGE AVAILABLE]
85. 3,991,011, Nov. 9, 1976, Flame retardant polymeric compositions containing halogenated Diels-Adler adducts with furan; Harry W. Marciniak, et al., 524/111; 521/98, 132 [IMAGE AVAILABLE]
86. 3,983,276, Sep. 28, 1976, Adhesive tape; Yasuo Matsumoto, 428/40.9, 334, 335, 336, 337, 352, 354, 412, 480, 523, 532, 900 [IMAGE AVAILABLE]
87. 3,981,958, Sep. 21, 1976, Graft copolymers and process for producing same; Kunihiro Nakashima, et al., 525/265; 428/31; 525/289, 310 [IMAGE AVAILABLE]
88. 3,976,620, Aug. 24, 1976, Phosphorus containing amides flame retardants; Peter Golborn, et al., 524/124, 131; 987/160 [IMAGE AVAILABLE]
89. 3,959,551, May 25, 1976, Dialkyl alkyl and aromatic sulfonamidomethyl phosphonates; Peter Golborn, et al., 428/272, 276, 921; 558/122, 175; 987/160 [IMAGE AVAILABLE]
90. 3,951,907, Apr. 20, 1976, Elastomeric and plastomeric materials containing amorphous carbonaceous silica; Povindar Kumar Mehta, 524/431; 106/407, 475; 423/435; 524/430, 492, 574, 575 [IMAGE AVAILABLE]

91. 3,935,162, Jan. 27, 1976, Dialkyl aromatic amidomethyl phosphonate flame retardants; Peter Golborn, et al., 524/124; 106/18.17; 521/906, 907; 524/131; 987/160 [IMAGE AVAILABLE]
92. 3,931,274, Jan. 6, 1976, Bis(2,3-dibromopropyl carbonates) of tetrahalobisphenol A; Robert M. Thomas, et al., 558/268; 524/281 [IMAGE AVAILABLE]
93. 3,922,468, Nov. 25, 1975, Fiber-elastomer laminates utilizing an unresinified m-aminophenol primer; Oliver W. Burke, Jr., et al., 428/414; 156/314, 330, 335, 338, 910; 428/494, 506, 524 [IMAGE AVAILABLE]
94. 3,920,770, Nov. 18, 1975, Rubber modified polyphenylene oxide composition; Seizo Nakashio, et al., 525/152; 524/343, 511; 525/391, 437 [IMAGE AVAILABLE]
95. 3,919,356, Nov. 11, 1975, Halogenated norbornene-methanonaphthalene derivatives and their applications; Nicodemus E. Boyer, 524/405; 523/462; 524/409, 411, 412, 467, 552, 554, 565, 576, 577, 590, 607; 525/69, 86 [IMAGE AVAILABLE]
96. 3,919,035, Nov. 11, 1975, Method of bonding styrene-butadiene block copolymers to other surfaces; Wolfgang Warrach, 156/315; 12/142F; 36/19.5; 156/334; 428/519, 520; 525/310 [IMAGE AVAILABLE]
97. 3,901,650, Aug. 26, 1975, Textile flame retardants; Peter Golborn, et al., 8/115.7, 127.5, 194; 252/608; 987/160 [IMAGE AVAILABLE]
98. 3,895,161, Jul. 15, 1975, Flame retardant materials; Peter Golborn, et al., 428/289, 288, 378, 921; 987/160 [IMAGE AVAILABLE]
99. 3,891,599, Jun. 24, 1975, Fire retardant polymer compositions; Harry W. Marciniak, et al., 524/412; 106/18.23, 190, 195, 196, 197.1; 524/462, 467, 925 [IMAGE AVAILABLE]
100. 3,890,275, Jun. 17, 1975, Imidomethyl phosphonates; Peter Golborn, et al., 524/104; 106/18.17, 18.18; 428/264; 524/94; 546/24; 987/364 [IMAGE AVAILABLE]
101. 3,885,912, May 27, 1975, Method of rendering textiles flame retardant with phosphorus containing melamine; Peter Golborn, et al., 8/115.7; 252/608, 609; 427/439; 428/393, 394, 921; 524/100; 987/68, 160 [IMAGE AVAILABLE]
102. 3,870,771, Mar. 11, 1975, DIALKYL ALKYL AND AROMATIC SULFONAMIDOMETHYL PHOSPHONATES; Peter Golborn, et al., 558/175; 8/183, 194; 524/139; 558/122; 987/160 [IMAGE AVAILABLE]

103. 3,865,792, Feb. 11, 1975, Copolymers and terpolymers and polyamide-polyesters; Sung Ki Lee, 528/341; 523/447, 448, 509; 524/30, 31, 39, 41, 44, 46; 525/25, 33, 40, 167, 185, 186, 419, 449; 528/335, 344, 345, 346, 347 [IMAGE AVAILABLE]
104. 3,862,263, Jan. 21, 1975, PRODUCTION OF MODIFIED POLYPHENYLENE OXIDE; Isao Maruta, et al., 525/68, 92D, 149, 151, 152, 905 [IMAGE AVAILABLE]
105. 3,859,371, Jan. 7, 1975, HALOGENATED NORBORNENE - METHANONAPHTHALENE COMPOUNDS; Charles S. Ilardo, 570/187; 524/497, 565, 567, 571, 583, 585, 590, 604, 606; 570/215 [IMAGE AVAILABLE]
106. 3,812,218, May 21, 1974, DIALKYL ALKYL AND CYCLIC PHOSPHORAMIDOMETHYL PHOSPHONATES; Peter Golborn, et al., 558/84; 524/117, 118, 124, 547, 548, 555, 560, 563, 565, 567, 571, 577, 583, 594, 597, 604, 606, 608, 610; 558/122, 157; 987/160 [IMAGE AVAILABLE]
107. 3,729,041, Apr. 24, 1973, TIRE; Hirokazu Kubota, 152/523, 524, 525, DIG.12; 428/913 [IMAGE AVAILABLE]
108. 3,681,511, Aug. 1, 1972, USES OF AND IMPROVEMENTS IN THE COATING OF SUBSTRATES; George T. Miller, 174/36; 106/1.05, 1.26; 174/102R; 216/83, 87; 427/117, 322 [IMAGE AVAILABLE]
109. 3,661,674, May 9, 1972, METHOD FOR THE MANUFACTURE OF FLEXIBLE SHEET MATERIALS; Maurice William Higgs, et al., 156/280, 148, 254; 427/430.1, 439; 428/234, 235, 289, 296, 297, 301, 302, 304.4, 904 [IMAGE AVAILABLE]
110. 3,657,048, Apr. 18, 1972, METHOD OF BONDING ELASTOMERIC MATERIALS; John C. Gardner, 156/307.3, 332, 333, 338 [IMAGE AVAILABLE]
111. 3,655,423, Apr. 11, 1972, PRETREATMENT OF PLASTIC SURFACES BEFORE THE APPLICATION OF AN ADHERENT ORGANIC COATING; Kingso C. Lin, et al., 428/413; 427/412.1, 412.3, 412.4; 428/423.1 [IMAGE AVAILABLE]
112. 3,650,911, Mar. 21, 1972, METALLIZING SUBSTRATES; Kingso Chingtsung Lin, 205/159, 163, 166, 183; 427/307, 322, 404 [IMAGE AVAILABLE]
113. 3,650,807, Mar. 21, 1972, SUBSTRATE HAVING METAL PHOSPHORUS OR METAL PHOSPHORUS SULFUR COMPOUND ON SURFACE AND CURED SICCATIVE COATING COMPOSITION THEREON; Gilbert Witschard, 428/432, 443, 446, 454, 455, 689 [IMAGE AVAILABLE]

114. 3,650,803, Mar. 21, 1972, METAL PLATING OF SUBSTRATES; Kingso Chingtsung Lin, 428/462; 106/1.27; 205/159, 160, 161, 163, 169; 427/404, 437; 428/458, 460, 463, 464, 465 [IMAGE AVAILABLE]
115. 3,650,708, Mar. 21, 1972, METAL PLATING OF SUBSTRATES; William P. Gallagher, 428/623; 205/166, 169; 427/123, 306, 404, 419.1, 438; 428/418, 461, 462, 463, 626, 656, 935, 936 [IMAGE AVAILABLE]
116. 3,642,584, Feb. 15, 1972, PROCESS FOR METAL PLATING OF SUBSTRATES; Edward J. Quinn, et al., 205/167; 106/1.25; 205/159, 166, 168, 183; 427/304 [IMAGE AVAILABLE]
117. 3,628,987, Dec. 21, 1971, PRESSURE SENSITIVE ADHESIVE FILM; Shinsaku Nakata, et al., 428/353; 427/208.4, 208.8, 230, 505; 428/356, 494; 525/87 [IMAGE AVAILABLE]
118. 3,620,834, Nov. 16, 1971, METAL PLATING OF SUBSTRATES; James J. Duffy, 428/461; 205/166; 427/306, 383.1, 383.5; 428/462, 463 [IMAGE AVAILABLE]
119. 3,616,295, Oct. 26, 1971, LOW-TEMPERATURE TRANSFORMATION OF NONCONDUCTIVE SUBSTRATES TO CONDUCTIVE SUBSTRATES; Sung K. Lee, 205/166, 159, 183 [IMAGE AVAILABLE]
120. 3,607,498, Sep. 21, 1971, METHOD OF PRODUCING TIRES HAVING DECORATIVE SIDEWALLS; Hirokazu Kubota, 156/116; 152/523, 524, DIG.10; 428/913 [IMAGE AVAILABLE]
121. 3,607,351, Sep. 21, 1971, PROCESS FOR METAL PLATING OF SUBSTRATES; Sung Ki Lee, 427/306; 106/287.18, 287.19, 287.24, 287.25, 287.28, 287.29, 287.3, 287.32; 205/166, 169; 427/404 [IMAGE AVAILABLE]

## SUMMARY:

BSUM(2)

**\*\*Graft\*\*** copolymerisation of vinyl monomers onto **\*\*natural\*\*** **\*\*rubber\*\*** has been extensively studied in the past. The work has resulted in commercial production of materials known as Heveaplus MG which contain **\*\*natural\*\*** **\*\*rubber\*\***-**\*\*methyl\*\*** **\*\*methacrylate\*\*** **\*\*graft\*\*** copolymer. Such materials have achieved some commercial success; but this has been limited by the difficulty of controlling the reaction of the **\*\*methyl\*\*** **\*\*methacrylate\*\*** with the rubber and the properties of the resulting product. The present invention adopts the alternative approach of reacting pre-formed side chains with the rubber molecules and this provides greater control of the structure of the **\*\*graft\*\*** copolymer

## SUMMARY:

## BSUM(3)

In general, the properties of polymers can be modified more or less by **\*\*grafting\*\*** a monomeric component to the polymers and the resulting **\*\*graft\*\*** copolymers are themselves useful as moldable resins with improved properties for further processing or are suitable, in combination with a . . . agent for resins, metals, fibers, glass and the like materials or as a binder for these materials. In fact, the **\*\*graft\*\*** polymerization of **\*\*methyl\*\* methacrylate\*\*** to **\*\*natural\*\* rubber\*\*** is adopted in the prior art as a means for improving the physical and electrical properties of **\*\*natural\*\* rubber\*\*** at high temperatures. However, such known **\*\*graft\*\*** copolymer was not satisfactory in thermoageing-resisting, weather-resisting and ozone-resisting properties because of the reason that the **\*\*natural\*\* rubber\*\*** structure constituting the backbone of such **\*\*natural\*\* rubber\*\*-\*\*methyl\*\* methacrylate\*\* graft\*\*** copolymer contains unsaturated bonds.



=> s polymeriz##### or polymeris#####

113838 POLYMERIZ#####

8120 POLYMERIS#####

L8 119083 POLYMERIZ##### OR POLYMERIS#####

=> s l2(3a)l8

L9 5164 L2(3A)L8

=> s l9(p)l1

L10 114 L9(P)L1

=> s l10(l)l3

L11 82 L10(L)L3

=> s l10(p)l3

L12 19 L10(P)L3

=> d l12 cit 1-19

1. 5,488,086, Jan. 30, 1996, Polycarbonate resin composition; Takashi Umeda, et al., 525/92A, 92E, 104, 439, 446, 464 [IMAGE AVAILABLE]

2. 5,466,757, Nov. 14, 1995, Process for production of chlorinated ethylene-propylene copolymers; Naotoshi Watanabe, et al., 525/352; 524/201, 211, 424, 425, 430; 525/263, 334.1, 356, 358, 368, 369 [IMAGE AVAILABLE]

3. 5,427,851, Jun. 27, 1995, Pressure sensitive adhesive and adhesive coated product; Rajendra Mehta, 428/356, 355, 496, 537.5; 524/88, 925, 928; 525/84 [IMAGE AVAILABLE]

4. 5,356,991, Oct. 18, 1994, Polyester-based shock-resistant compositions and process for their preparation; Antonio Chiolle, et al., 525/66, 67, 92A, 131, 133, 148 [IMAGE AVAILABLE]

5. 5,288,807, Feb. 22, 1994, Vinyl monomer compositions with accelerated surface cure; Frederick P. Hinz, 525/279; 106/719; 524/8, 785, 853, 854, 856; 525/245, 263, 289, 290, 292, 303, 304, 310, 316 [IMAGE AVAILABLE]

6. 5,253,691, Oct. 19, 1993, Tire having specified belt rubber composition; Richard M. Sriver, 152/537, 564 [IMAGE AVAILABLE]

7. 5,252,665, Oct. 12, 1993, Polyester based shock resistant compositions and process for their preparation; Antonio Chiolle, et al., 525/64, 92A, 173 [IMAGE AVAILABLE]

8. 5,194,497, Mar. 16, 1993, Alloys of thermoplastic polymers containing oxetanyl groups; Karl-Erwin Piejko, et al., 525/75, 93, 206; 526/266 [IMAGE AVAILABLE]

9. 5,190,818, Mar. 2, 1993, Adhesive composition for temporary adhesive

bonding of paper sheets; Tsutomu Sakai, 428/355, 356, 496, 511, 512;  
524/47, 492 [IMAGE AVAILABLE]

10. 5,115,021, May 19, 1992, Pneumatic tires; Robert J. Blythe, et al.,  
525/84; 152/209R; 525/78 [IMAGE AVAILABLE]

11. 5,087,673, Feb. 11, 1992, Process for production of chlorinated  
ethylene-propylene copolymers; Naotoshi Watanabe, et al., 525/356, 334.1,  
358 [IMAGE AVAILABLE]

12. 4,721,757, Jan. 26, 1988, Vinyl monomer compositions with  
accelerated surface cure; Frederick J. Schindler, 525/245, 248, 289, 290,  
302 [IMAGE AVAILABLE]

13. 4,481,332, Nov. 6, 1984, Heat resistant polyphenylene ether  
composition; Akiyoshi Somemiya, et al., 525/132, 68, 474; 528/211 [IMAGE  
AVAILABLE]

14. 4,420,573, Dec. 13, 1983, Method of treating water-in-oil  
dispersions; Sidney G. Fogg, et al., 523/333; 210/924, 925; 523/334, 335,  
336, 339; 524/917 [IMAGE AVAILABLE]

15. 4,016,665, Apr. 12, 1977, Signboard using macromolecular elastomer  
having adhesive layer; Mitsushi Sakota, 40/582, 594; 428/343 [IMAGE  
AVAILABLE]

16. 3,981,958, Sep. 21, 1976, Graft copolymers and process for producing  
same; Kunihiro Nakashima, et al., 525/265; 428/31; 525/289, 310 [IMAGE  
AVAILABLE]

17. 3,951,907, Apr. 20, 1976, Elastomeric and plastomeric materials  
containing amorphous carbonaceous silica; Povindar Kumar Mehta, 524/431;  
106/407, 475; 423/435; 524/430, 492, 574, 575 [IMAGE AVAILABLE]

18. 3,729,041, Apr. 24, 1973, TIRE; Hirokazu Kubota, 152/523, 524, 525,  
DIG.12; 428/913 [IMAGE AVAILABLE]

19. 3,607,498, Sep. 21, 1971, METHOD OF PRODUCING TIRES HAVING  
DECORATIVE SIDEWALLS; Hirokazu Kubota, 156/116; 152/523, 524, DIG.10;  
428/913 [IMAGE AVAILABLE]

US PAT NO: 5,115,021 [IMAGE AVAILABLE]

L12: 10 of 19

DETDESC:

DETD(5)

MG 30 and MG 49 are each a graft copolymer obtained by \*\*graft\*\*  
\*\*polymerising\*\* \*\*methyl\*\* \*\*methacrylate\*\* in \*\*natural\*\* \*\*rubber\*\*  
latex and containing, respectively, nominal proportions of 30 and 49% by  
weight of poly(\*\*methyl\*\* \*\*methacrylate\*\*). They have been obtained from  
the Rubber Research Institute of Malaysia, PO Box 150, Kuala Lumpur,  
Malaysia.

DETDESC:

DETD(9)

The . . . agent to be used for the formation of the undercoating layer 11 may be a mixture of 100 parts of \*\*natural\*\* \*\*rubber\*\*, 30 parts of \*\*methyl\*\* \*\*methacrylate\*\* and 500 parts of toluene, or a solution prepared by mixing 20 parts of \*\*methyl\*\* \*\*methacrylate\*\*, 20 parts vinyl acetate monomer and 500 parts of toluene with 100 parts of chloroprene rubber with stirring at 80.degree.C for about 8 hours to carry out \*\*graft\*\* \*\*polymerization\*\* and dissolving the polymerization product in 500 parts of methyl ethyl ketone.

=> d 15 cit 68,87

68. 4,221,681, Sep. 9, 1980, Method of forming graft copolymers by attaching pre-polymerized side chains to a natural or unsaturated synthetic rubber backbone, and the resulting graft copolymers; David S. Campbell, et al., 525/194, 232, 376 [IMAGE AVAILABLE]

87. 3,981,958, Sep. 21, 1976, Graft copolymers and process for producing same; Kunihiro Nakashima, et al., 525/265; 428/31; 525/289, 310 [IMAGE AVAILABLE]

=> d 112 6,10,18

6. 5,253,691, Oct. 19, 1993, Tire having specified belt rubber composition; Richard M. Sriver, 152/537, 564 [IMAGE AVAILABLE]

10. 5,115,021, May 19, 1992, Pneumatic tires; Robert J. Blythe, et al., 525/84; 152/209R; 525/78 [IMAGE AVAILABLE]

18. 3,729,041, Apr. 24, 1973, TIRE; Hirokazu Kubota, 152/523, 524, 525, DIG.12; 428/913 [IMAGE AVAILABLE]

=>

=> d his

(FILE 'USPAT' ENTERED AT 14:36:54 ON 08 JUN 96)

L1 14812 S NATURAL RUBBER#  
L2 27546 S GRAFT# OR GRAFTED OR GRAFTING  
L3 34339 S METHYLMETHACRYLATE OR METHYL METH ACRYLATE OR METHYL MET  
HAC  
L4 740 S L1(L)L2(L)L3  
L5 121 S L1(P)L2(P)L3  
L6 681 S DEPROTEINIZ##### OR DEPROTEINIS#####  
L7 1 S L5(L)L6  
L8 119083 S POLYMERIZ##### OR POLYMERIS#####  
L9 5164 S L2(3A)L8  
L10 114 S L9(P)L1  
L11 82 S L10(L)L3  
L12 19 S L10(P)L3  
L13 82 S L11(L)L1